

# Adolescents' knowledge of oral health: a population-based study

## Conhecimento do adolescente em relação a saúde bucal: um estudo de base populacional

### Abstract

**Purpose:** To evaluate the knowledge on oral health of 10-19 year-old adolescents from the city of Campina Grande, PB, in the Northeast region of Brazil.

**Methods:** A cross-sectional study was conducted with a random sample of 679 adolescents attending public schools in Campina Grande, PB, Brazil. Data were collected using a semi-structured questionnaire and analyzed with Chi-square and Fischer's exact tests.

**Results:** Most information received by the participants concerned dental diseases (81%,  $P=0.026$ ), and the dentist (66%,  $P=0.475$ ) was the most frequently cited source. Approximately half of the subjects brushed their teeth 3 to 4 times a day (50%,  $P=0.039$ ). A total of 77% ( $P=0.037$ ) had received information on how to brush their teeth and 46% ( $P=0.143$ ) on what type of brush should be used; 51% ( $P<0.01$ ) affirmed to use dental floss and 49% ( $P=0.201$ ) had received information on how to use it. Most adolescents visited the dentist during the previous year (57%,  $P=0.312$ ), and prevention was the most frequent reason (50%,  $P=0.115$ ). Gender was significantly associated with some variables, especially those of behavioral nature.

**Conclusion:** The findings of this survey demonstrate the importance of health strategies to positively influence adolescents who may serve as health multipliers.

**Key words:** Adolescent health; adolescent; oral health

### Resumo

**Objetivo:** Verificar o conhecimento do adolescente de 10 a 19 anos de escolas públicas de Campina Grande, PB, em relação à saúde bucal.

**Método:** Foi realizado um estudo transversal com amostra probabilística de 679 adolescentes de escolas públicas de Campina Grande, PB. A coleta de dados foi feita por meio de questionário semiestruturado. Os dados foram estatisticamente analisados por testes Qui-Quadrado e Exato de Fischer, ao nível de significância de 5%.

**Resultados:** A maioria recebeu informação sobre as doenças bucais (88%,  $P=0,026$ ), sendo o cirurgião-dentista (66%,  $P=0,475$ ) a fonte mais citada. Aproximadamente metade escovavam os dentes de 3 a 4 vezes por dia (50,1%,  $P=0,039$ ). Um percentual de 77% ( $P=0,037$ ) recebeu informação sobre como escovar os dentes e 46% ( $P=0,143$ ) sobre qual o tipo de escova que se deve usar; 51% ( $P<0,01$ ) utiliza o fio dental e 49% ( $P=0,201$ ) recebeu informações de como usá-lo. A maioria visitou o cirurgião-dentista no último ano (57%,  $P=0,312$ ) e a prevenção foi o motivo mais frequente (50%,  $P=0,115$ ). O gênero apresentou associação significativa com algumas variáveis analisadas, em especial as comportamentais.

**Conclusão:** Estudos desta natureza embasam estratégias de saúde na tentativa de influenciar positivamente os adolescentes que atuarão em última análise como agentes multiplicadores de saúde.

**Palavras-chave:** Saúde do adolescente; adolescente; saúde bucal

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## Introduction

Adolescence refers to the period of life between 10 and 19 years old, according to the World Health Organization (WHO) criteria. During this phase of life, individuals are in constant biological, psychological and social development, which make them more vulnerable and in need of greater attention to health (1,2).

Currently, there is an extension of this life stage as a result of early puberty, longer schooling period, and late entry into the labor market. Entering into a long period of intense growth and development, adolescents seeking health services are vary considerably and require specific actions (3). Adolescence is a stage in which general health is presented at its best, though it is a period of increased risk to oral health because of the greater independence with regard to the consumption of sugary foods and a certain revulsion regarding oral hygiene (1). Data published in the last national epidemiological survey conducted in Brazil (SB Brazil) revealed that about 14% of Brazilian adolescents have never been to the dentist. There are marked regional differences, whereas less than 6% of adolescents from the southern region reported ever having been to the dentist, while this value increased to almost 22% in the northeast region. Dental pain was one of the main reasons for going to the dentist reported by over 30% of the adolescents, while routine visits were reported by 34% of the subjects. Early tooth loss is severe and the need for some type of denture begins to emerge around the age of 15 to 19 years old (4). Health education has been considered an important strategy to promote community health through the development of personal skills for self care. Within this perspective and considering the weakness experienced in adolescence, it is necessary to develop educational measures on oral health in schools by means of programs capable of meeting the needs and characteristics of this portion of population (5-7).

The identification of adolescents as subjects with a proactive behavior in health decisions and the best persons to define their needs/priorities and expectations represents the possibility of having positive interactions with health professionals and their own environment. This would stimulate their interest on the search for and maintenance of healthier habits (8).

The relationship of adolescents with health services and their knowledge of oral health are not well explored in Brazil, although these themes are relevant and will help to define health actions focused on this population group. In light of this, the aim of this study was to evaluate the knowledge of adolescents attending public schools in a Brazilian city about oral health and attendance to dental services.

## Methods

This study was approved by UEPB's Research Ethics Committee (CAAE 0179.0.133.000-08). This cross-sectional, exploratory investigation included 10-19-year-old adolescents attending public schools in Campina Grande,

which is the second most important city in the state of Paraíba, Brazil. The city is distant 130 km from the capital of Paraíba State and is located in the "Agreste" region of the State between the litoral and the hinterland, in the eastern region of the Borborema plateau. The city has a total area of 620.6 km<sup>2</sup> and has an estimated population of 371,060 habitants (demographic density of 612 hab/km<sup>2</sup>) (9).

The study population comprised 11,773 students. A stratified sampling procedure was performed *per* health district and cluster (school). In each stratum was selected a certain number of schools and in each school was selected a random sample proportional to the number of students per school. A confidence interval of 95% was used and with 5% error. The following equation was used for sample calculation:

$$n = \frac{N \cdot z^2 \cdot p \cdot q}{N(n-1) + z^2 \cdot p \cdot q}$$

Where: n= corresponds to the sample size; N= corresponds to the population size; Z = chosen significance level in number of deviations (sigma); d = error margin and p = proportion of the characteristics sought in the universe, calculated as a percentage. For p and q values, 50% percentage was used (10). Thus, a sample of 668 students distributed proportionally among 6 health districts of Campina Grande was obtained.

Data collection was performed by two researchers from August to November 2008, using a semi-structured self-applied questionnaire. The questions referred to information and source of information about dental diseases, frequency of brushing and sugar consumption, instructions on oral hygiene, frequency of visits to the dentist and reason for consultation. At baseline, the study purposes were explained to the eligible participants and informed consent forms were signed by the subjects or their parents/guardians. The reliability of responses was tested by the "face" validation method in 10% of research subjects. Using this method, the researcher asks the research subjects to make clear in their own words, what they understood about each question (11).

Data were organized using the SPSS (Statistical Package for the Social Sciences; SPSS Inc., Chicago, IL, USA) software and presented as descriptive (absolute and percentage distributions) and analytical statistics. The chi-square and Fisher's exact tests were used to assess the significance of associations at the 5% level of significance.

## Results

Ten subjects refused to participate in the study and fill out the questionnaire. A total of 679 adolescents aged between 10 to 19 years were enrolled, being 311 (45.8%) male and 368 (54.2%) female. Table 1 shows that females received more information about oral health ( $P=0.026$ ), journals/magazines being the only source of information with a significant difference between genders ( $P=0.016$ ).

**Table 1.** Assessment of issues related to information about dental diseases according to gender of the adolescents (Campina Grande, PB, Brazil, 2009).

Variable	Gender				Total group		P-value
	Male		Female		n	%	
	n	%	n	%			
• Did you receive information about how oral diseases occur?							
Yes	241	77.5	309	84.2	550	81.1	$P^{(2)} = 0.026^*$
No	70	22.5	58	15.8	128	18.9	
Total <sup>(1)</sup>	311	100.0	367	100.0	678	100.0	
• Who informed you how dental diseases occur?							
Dentist							
Yes	163	67.6	200	64.7	363	66.0	$P^{(2)} = 0.475$
No	78	32.4	109	35.3	187	34.0	
Doctor/health post							
Yes	94	39.0	123	39.8	217	39.5	$P^{(2)} = 0.849$
No	147	61.0	186	60.2	333	60.5	
Professor							
Yes	43	17.8	72	23.3	115	20.9	$P^{(2)} = 0.118$
No	198	82.2	237	76.7	435	79.1	
Friends							
Yes	33	13.7	55	17.8	88	16.0	$P^{(2)} = 0.192$
No	208	86.3	254	82.2	462	84.0	
Magazines							
Yes	31	12.9	64	20.7	95	17.3	$P^{(2)} = 0.016^*$
No	210	87.1	245	79.3	455	82.7	
Television							
Yes	95	39.4	125	40.5	220	40.0	$P^{(2)} = 0.806$
No	146	60.6	184	59.5	330	60.0	
Total	241	100.0	309	100.0	550	100.0	

\* Significant difference at 5.0%; <sup>(1)</sup> The difference between n values was due to lack of information; <sup>(2)</sup> Through the chi-square test.

Table 2 shows that gender presented significant differences related to frequency of brushing ( $P=0.039$ ), sugar consumption ( $P=0.018$ ) and flossing ( $P<0.001$ ).

**Table 2.** Assessment of issues related to oral hygiene and sugar consumption, according to gender of the adolescents (Campina Grande, PB, Brazil, 2009).

Variable	Gender				Total group		P-value
	Male		Female		n	%	
	n	%	n	%			
• How often do you brush your teeth a day?							
1 to 2	118	38.4	110	30.1	228	33.9	$P^{(2)} = 0.039^*$
3 to 4	147	47.9	190	51.9	337	50.1	
More than 4	41	13.4	66	18.0	107	15.9	
Not brushing	1	0.3	-	-	1	0.1	
Total <sup>(1)</sup>	307	100.0	366	100.0	673	100.0	
• Did you receive instructions on how to brush your teeth?							
Yes	235	75.8	288	78.9	523	77.5	$P^{(3)} = 0.337$
No	75	24.2	77	21.1	152	22.5	
Total <sup>(1)</sup>	310	100.0	365	100.0	675	100.0	
• Did you receive instructions on what type of toothbrush to be used?							
Yes	132	42.6	176	48.2	308	45.6	$P^{(3)} = 0.143$
No	178	57.4	189	51.8	367	54.4	
Total <sup>(1)</sup>	310	100.0	365	100.0	675	100.0	
• Do you use dental floss?							
Yes	122	39.6	218	60.1	340	50.7	$P^{(2)} < 0.001^*$
No	186	60.4	145	39.9	331	49.3	
Total <sup>(1)</sup>	308	100.0	363	100.0	671	100.0	
• Did you receive instructions about dental floss use?							
Yes	130	42.2	172	47.1	302	44.9	$P^{(3)} = 0.201$
No	178	57.8	193	52.9	371	55.1	
Total <sup>(1)</sup>	308	100.0	365	100.0	673	100.0	
• How often do you consume sugar a Day?							
1 to 2 times during meals	149	48.4	137	37.3	286	42.4	$P^{(3)} = 0.018^*$
3 to 4 times during meals	46	14.9	53	14.4	99	14.7	
3 to 4 times during meals	41	13.3	62	16.9	103	15.3	
All Day	72	23.4	115	31.3	187	27.7	
Total <sup>(1)</sup>	308	100.0	367	100.0	675	100.0	

\* Significant difference at 5.0%; <sup>(1)</sup> The difference between n values was due to lack of information; <sup>(2)</sup> Using the Fisher Exact test; <sup>(3)</sup> Through the chi-square test.

Table 3 shows that most adolescents said that there were situations when they spent more time brushing ( $P=0.023$ ), and the answer "when going out" was the justification that presented a significant difference between genders ( $P=0.035$ ).

**Table 3.** Assessment of issues related to tooth brushing according to gender (Campina Grande, PB, Brazil, 2009).

Variable	Gender				Total group		P-value
	Male		Female		n	%	
	n	%	n	%			
• Are there situations when you spend more time brushing your teeth?							
Yes	301	96.8	364	99.2	665	98.1	$P^{(2)} = 0.023^*$
No	10	3.2	3	0.8	13	1.9	
Total <sup>(1)</sup>	311	100.0	367	100.0	678	100.0	
• Which situations do you take long brushing?							
When going out							
Yes	154	51.2	216	59.3	370	55.6	$P^{(2)} = 0.035^*$
No	147	48.8	148	40.7	295	44.4	
When eating sweet and sticky food							
Yes	195	64.8	242	66.5	437	65.7	$P^{(2)} = 0.646$
No	106	35.2	122	33.5	228	34.3	
When the mouth feels dirty or notice bad breath							
Yes	180	59.8	228	62.6	408	61.4	$P^{(2)} = 0.455$
No	121	40.2	136	37.4	257	38.6	
Other situations							
Yes	4	1.3	4	1.1	8	1.2	$P^{(3)} = 1.000$
No	297	98.7	360	98.9	657	98.8	
Total	301	100.0	364	100.0	665	100.0	

\* Significant difference at 5.0%; <sup>(1)</sup> The difference between n values was due to lack of information; <sup>(2)</sup> Using the Fisher Exact test; <sup>(3)</sup> Through the chi-square test.

Table 4 highlights that 3.1% of adolescents had not been to the dentist ( $P=0.244$ ). The remaining questions (last visit to the dentist and the reason for consultation) showed no significant differences between genders.

**Table 4.** Assessment of issues related to visits to the dentist according to gender (Campina Grande, PB, Brazil, 2009).

Variable	Gender				Total group		P-value
	Male		Female		n	%	
	n	%	n	%			
• Have you ever been to the dentist?							
Yes	304	97.7	354	96.2	658	96.9	$P^{(2)} = 0.244$
No	7	2.3	14	3.8	21	3.1	
Total	311	100.0	368	100.0	679	100.0	
• When was the last time you went to the dentist?							
Less than 1 year	169	55.6	207	58.5	376	57.1	$P^{(2)} = 0.312$
More than 1 year	38	12.5	33	9.3	71	10.8	
More than 2 years	31	10.2	27	7.6	58	8.8	
Don't remember	66	21.7	87	24.6	153	23.3	
• What was the reason for your consultation?							
Prevention							
Yes	141	46.4	186	52.5	327	49.7	$P^{(2)} = 0.115$
No	163	53.6	168	47.5	331	50.3	
Pain							
Yes	84	27.6	84	23.7	168	25.5	$P^{(2)} = 0.252$
No	220	72.4	270	76.3	490	74.5	
Aesthetics							
Yes	36	11.8	56	15.8	92	14.0	$P^{(2)} = 0.142$
No	268	88.2	298	84.2	566	86.0	
Obturation							
Yes	90	29.6	110	31.1	200	30.4	$P^{(2)} = 0.683$
No	214	70.4	244	68.9	458	69.6	
Teeth extraction							
Yes	2	0.7	8	2.3	10	1.5	$P^{(3)} = 0.117$
No	302	99.3	346	97.7	648	98.5	
Other reasons							
Yes	4	1.3	2	0.6	6	0.9	$P^{(3)} = 0.423$
No	300	98.7	352	99.4	652	99.1	
Not informed							
Yes	8	2.6	7	2.0	15	2.3	$P^{(2)} = 0.575$
No	296	97.4	347	98.0	643	97.7	
Total	304	100.0	354	100.0	658	100.0	

<sup>(1)</sup> The difference between n values was due to lack of information; <sup>(2)</sup> Using the Fisher Exact test; <sup>(3)</sup> Through the chi-square test.

## Discussion

Education is a key strategy in the process of forming attitudes that promote and maintain health. Greater knowledge about health promotes changes in attitudes and motivation about healthy behaviors, increasing self-sufficiency to perform tasks, accelerating results of interventions to promote health (12). Highlighting the adolescent as an active subject in health decisions and as the greatest expert on their needs and desires represents the possibility of positive interactions with health professionals, facilitating construction of healthy education programs (13).

Despite the adoption of all criteria and methodological steps, some questionnaires were not filled in completely, causing limitations to this research. This is a common bias when using this instrument in data collection (14). Most adolescents received guidance on oral health (81.1%), while females showed a greater number of positive responses. This findings is contrary to those of Ostberg et al. (15) and Santos et al. (16), who showed no significant differences between gender in this issue. Concerning information source, the dentist had a higher percentage (66%), showing active participation of these professionals in the construction of oral health concepts (16). The second and third greatest sources of information were the doctor and television. The latter has a great influence on lifestyle and behavior as young Brazilians watch, on average, 3.5 hours of television *per day* (17). It is noteworthy that magazines were the only source that showed a significant difference between genders, possibly due to girls' interest in this type of media.

Young respondents, on the average, reported brushing 3 to 4 times a day (50%), which is in accordance with other Brazilian studies (7,16,18,19). This frequency is higher than that reported by international studies of this age group (20,21), reinforcing the hypothesis of media influence in the country with advertisements on the need for oral hygiene three times a day. In addition, there may have been information bias, since individuals tend to report acceptable behavior even when they do not adopt them. On this issue, there was a significant difference between genders. The influence of gender on oral health behavior has been reported in the literature (7,15,22).

Most had received instructions on how to brush their teeth (77%), however, less than half had received information on the type of brush to be used (46%) or on how to use dental floss (45%). This fact deserves consideration, since professionals seem to direct its guidelines most for brushing methods. About 49% of subjects reported not using dental floss, a lower percentage than in other studies (7,19). However, this percentage is significant when compared to the study by Knishkowsky and Sgan-Cohen (23), who reported that only 7% of Israeli adolescents used it and 10% did not

know about dental floss. There was greater use of dental floss among girls, as reported elsewhere (15). Free brush distribution to public schools, probably contributed to the overvaluation of the brush on oral hygiene. In addition, the dental floss is a more expensive project and not so widespread (7,24). Sugar consumption was more frequent among girls (42%). Otsberg et al. (22) reported no association between gender and sweets consumption. Although the consequences of this dietary habit was not addressed in this study, this group, which presented the largest number of tooth brushing and flossing sessions, seemed to be more aware of the relationship between sweet foods and dental caries.

The adolescents were asked if there was any situation that led them to spend more time on brushing, 98% responded affirmatively, with a significant difference between genders. The reasons mentioned most frequently were "when eating sweets and sticky food" (66%) "when feeling mouth with bad breath" (61) and "when going out" (56%). Increased awareness of hygiene after eating as well as esthetics were reflected in this issue, and may be related to the advice given by the dentist and media influence, as well as the need for adolescents to have a good appearance (18). The use of dental services by Brazilian schoolchildren has not been investigated in depth. In this respect, when asked whether they had visited the dentist, only 3% of adolescents reported never seeing the dentist, a lower percentage than that reported for the Northeast in the last national survey (4). Campina Grande (PB) is a medium-sized city where access to dental services is easier. Moreover, what could have contributed to this result was the implementation of an oral health program by the government (Smile Brazil). Most adolescents (57%) reported having visited the dentist in the last year, without association of this variable with gender. Other studies have described higher frequency of annual consultations by women (7,15,25). The most cited reasons were prevention (50%), filling (30%) and pain (25%). In contrast to the study by Freddo et al.(7) in which curative treatment was the most frequent cause for adolescents seeking treatment.

From the results of this study, it cannot be stated categorically that gender influences oral health behavior, as only some variables presented are significantly associated with gender. However, some reflections can be drawn from our findings, such as the importance of developing collective strategies based on the prevention of oral diseases in school, the training of teachers to control their risk factors, and continuing education by health professionals in order to form adolescent health multipliers that can disseminate knowledge of oral health and diseases to their peers. The findings of this survey demonstrate the importance of health strategies in an attempt to positively influence adolescents who will ultimately serve as health multipliers.

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